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EXAMINER
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CHEN, KEATH T

ART UNIT	PAPER NUMBER
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1792

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03/18/2010

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/757,302	<b>Applicant(s)</b> HE ET AL.	
	<b>Examiner</b> KEATH T. CHEN	<b>Art Unit</b> 1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 16 October 2009.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-3 and 5-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 5-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01/14/2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)         | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Response to Amendment***

1. Applicants petition to revive, filed on 10/16/2009, has been granted. The claim amendment filed on 10/16/2009, addressing claims 1-17 rejection from the non-final office action (02/23/2007) by amending claims 1-3 and 5-15; cancelling claim 4; and adding new claims 18-20 is entered, and will be addressed below.

### ***Drawings***

The drawings are objected to because solid black shading areas are not permitted, see 37 CFR 1.84(m). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required

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corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim interpretation***

The “positionable within the chamber such that ... the substrate may be positioned in accordance with a matrix of x, y and z coordinates” of claim 1, is inclusive of “by the coordinates of the rotational, vertical and horizontal position” ([0026], lines 7-8, see also Response to Argument below).

Various “means for” in the claims will NOT be interpreted as 35 USC 112 6<sup>th</sup> paragraph because there is no disclosure of corresponding structure in the Specification, see MPEP 2161.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

**2. Claims 1-3, 5, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wu et al. (US 6045671, hereafter '671).**

'671 teaches some limitations of:

Claim 1: A combinatorial sputtering system (Fig. 14, col. 25, lines 23-24, the claimed "system for providing a plurality of different combinatorial materials") is capable of deposition catalyst (see also col. 31, lines 10-11, the claimed "catalyst materials"), the array can be screened for resulting materials having useful properties (col. 6, lines 6-7, the claimed "for evaluation"), thin-film deposition techniques may include sputtering technique, electron beam or thermal evaporation, ... (col. 19, lines 39-51, these are known physical vapor deposition), a processing chamber 256 under vacuum (col. 22, lines 45-46, Fig. 12 clearly applicable to Fig. 14, the claimed "sealable chamber"), a gate valve 274 (the claimed "access means"), eight RF magnetron sputtering guns 110 ... inserted from the side of the reaction chamber in a complete circle (col. 25, lines 24-27, the claimed "the chamber including a plurality of separately controllable plasma sources radially disposed about a central location within the chamber such that the plasma directed from the source may be focused upon the central location", note that deposition aiming toward the central location is considered a "focused" deposition), components are delivered ... simultaneously ... the power of two electron beam sources can be varied so that component A is delivered to the substrate in increasing or decreasing amounts while component B is either delivered in a constant amount or varied in the opposite direction of component A. In another example, two or more components are delivered using any of the delivery techniques described herein (col.

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18, lines 28-38, further underlines the claimed "separately controllable plasma sources", also the claimed "at least one of the plurality of separately controllable plasma sources comprising a cluster of more than one plasma gun oriented such that each gun in the cluster is focused toward the central location" because of simultaneous delivery of two components), the substrate is attached to a shaft (col. 25, lines 27-28, the claimed "one substrate disposed at the central location of the chamber" as shown in Fig. 14), masking pattern 134 (col. 25, line 33, see Fig. 14 for four discrete separated areas, the claimed "having a plurality of discrete separated areas thereon to which the plasma is directed"), the substrate is attached to a shaft 130 having linear and rotational motion (col. 25, lines 27-28, the claimed "substrate being controllably positionable within the chamber such that a selected area upon the substrate may be positioned in accordance with a matrix of x, y and z coordinates in an alignment with respect to the focus of each of the plurality of separately controllable plasma sources", except the linear motion move in one dimension, does not move two directions (the x and y direction when facing a plasma source as the z direction, see claim interpretation above), system 250 ... includes a processor (col. 22, lines 66-67, the claimed "a means for controlling") film thickness and uniformity can be controlled by the spraying time, substrate-nozzle distance, ... and/or positioning the spray gun, spray nozzle or substrate, etc. (col. 28, lines 25-28, the claimed "controlling the plasma sources and the substrate") the components can be delivered to predefined regions on the substrate ...sequentially (col. 30, lines 44-46, the claimed "each selected area upon the substrate may be sequentially aligned with respect to each plasma source") this system ... provides spatial variation of

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gas mixture and gas **exposure** time over the substrate (col. 31, lines 1-3, the claimed “according to predetermined parameters that determine the exposure of the area to one or more than one of the controllable plasma sources”)

Fig. 14 of '671 teaches a shaft 130 having linear and rotational motion (col. 25, lines 27-28) with one dimension linear motion, does not explicitly teaches the linear motion in both x and y direction, therefore, does not explicitly teaches (substrate being controllably positionable within the chamber ...) in accordance with a matrix of x, y and z coordinates, of claim 1.

In a different embodiment (Fig. 5), '671 teaches the substrate may also be **translated** relative to the frame 206 so that shutter masks 202, 203 may be positioned at selected regions on the substrate (col. 17, lines 44-46) instead of by moving the X--X and Y--Y shutter masks 202, 203 (col. 17, lines 40-41) and/or forming the two dimension pattern of Figs. 2-4. Therefore, needs a two dimensional motion mechanism.

At the time of the invention was made, it would have been obvious to a person having ordinary skill in the art to have added a two dimension motion mechanism, as taught by Fig. 5 of '671, to the apparatus in Fig. 14 of '671, for the purpose of forming two dimensional pattern in Figs. 2-4 of '671.

'671 further teaches the limitations of:

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Claim 2: system 250 ... includes a processor (col. 22, lines 66-67, the claimed “the means for controlling”, processor intrinsically having programmable parameters), the power of two electron beam sources can be varied ... in another example, two or more components are delivered using any of the delivery techniques described herein (col. 18, lines 31-37, the claimed “determining for a specified flux of plasma power”), this system ... provides spatial variation of gas mixture and gas exposure time over the substrate (col. 31, lines 1-3, the claimed “determining for a specified flux of plasma time, the characteristics of the material deposited by the plasma source upon the selected area of the substrate”).

Claim 3: the substrate is attached to a shaft 130 having ... rotational motion (col. 25, lines 27-28, the claimed “the substrate is positioned with respect to a rotator”) and eight RF magnetron sputtering guns 110 ... inserted from the side of the reaction chamber in a complete circle (col. 25, lines 24-27, the claimed “centrally disposed within the chamber such that the selected area of the substrate can be rotated within the central location of the chamber to align the area with the focus of the one or more plasma sources”).

Claim 5: Fig. 14 shows the substrate holder 132 is shown to be planar (therefore, the claimed “the substrate is a plane surface”, and as the shaft 132 rotates, it is capable of “the approximate focus of each plasma source and the plane surface of the substrate are each maintained within the chamber in alignment with each other”).

Claim 12: components of target materials can be selectively deposited onto the substrate 356 sequentially or simultaneously as a mixture of two or more target



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materials (col. 28, lines 10-12, the claimed “the plasma sources are controlled such that the materials originating from the sources are deposited upon an area of the substrate in at least one of 1) a sequential layer deposition and 2) a co-deposition”).

**3. Claims 6, 8-9, and 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over ‘671, in view of Corderman et al. (US 6491967, hereafter ‘967).**

Fig. 14 of ‘671 teaches all limitations of claim 3, as discussed above. The embodiment in Fig. 14 of ‘671 teaches eight RF magnetron sputtering guns 110 ... inserted from the side of the reaction chamber in a complete circle (col. 25, lines 24-27, the claimed (the substrate ...) “is centrally positioned within the chamber”), the substrate is attached to a shaft 130 having linear and rotational motion (col. 25, lines 27-28, the claimed “the substrate being moveable”, “such that each separately defined area upon the surface of the substrate may be positioned” and “in essential alignment with the focus of one or more than one plasma source”. Fig. 14 of ‘671 does not teaches multiple separately defined circular areas, a program controlled x-y table, control means of x-y table of claim 6.

Fig. 5 of ‘671 teaches the substrate may also be **translated** relative to the frame 206 so that shutter masks 202, 203 may be positioned at selected regions on the substrate (col. 17, lines 44-46) instead of by moving the X--X and Y--Y shutter masks 202, 203 (col. 17, lines 40-41), therefore, teaches a x-y table that moves the substrate.

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In Figs. 1-2, yet another different embodiment, of '671 further teaches: opening in the mask ... are circular (col. 12, lines 44-50, the claimed "the substrate includes multiple separately defined circular areas")

'967 is an analogous art in the field of plasma spray (title) in combinatorial high throughput screening (abstract). '967 teaches a robot arm (the claimed program controlled) that either with 6-axis robot or a 2 axis x-y manipulator can also be used (col. 3, line 66 to col. 4, line 3, the claimed program controlled x-y table and control means for the x-y table).

At the time of the invention was made, it would have been obvious to a person having ordinary skill in the art to have adopted the multiple separately defined circular areas pattern, as taught in Figs. 1-2 (col. 12, lines 44-50) of '671, and the **translation** of the substrate, instead of translation of mask, as required by '671 (col. 17, lines 40-46), particularly to have replaced the shaft 130 in Fig. 14 of '671 with the robot arm, as taught by '967, because its commonly known and suitability. The selection of something based on its known suitability for its intended use has been held to support a *prima facie* case of obviousness. MPEP 2144.07.

Figs. 1-4 of '671 also clearly shows the "the multiple separately defined selected areas of the substrate comprise a plurality of separately defined areas arranged a matrix defined by columns and rows" of claim 8 and "the relationship of the number (N)

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of separately defined areas in the rows to the number of separately defined areas in the columns is  $\text{rows}_N = \text{columns}_N$ ” of claim 9.

‘671 further teaches a system 250 ... includes a processor (col. 22, lines 66-67, the claimed “programmed means”) film thickness and uniformity can be controlled by the spraying time, substrate-nozzle distance, ... and/or positioning the spray gun, spray nozzle or substrate, etc. (col. 28, lines 25-28, the claimed “selecting ... 1) a plasma source within a cluster; 2) the power and the duration of operation of the source” of claim 15).

Alternatively, the above combination would also have had the limitations of: a robot arm (imported from ‘967, the claimed programmed means), while film thickness and uniformity can be controlled by the ... positioning the substrate, etc. (col. 28, lines 25-28, the claimed “the position of the substrate such that a selected area of the substrate is exposed to the plasma source for the duration of operation determined” of claim 15).

‘671 teaches components are delivered ... **simultaneously** ... the power of two electron beam sources can be varied so that component A is delivered to the substrate in increasing or decreasing amounts while component B is either delivered in a constant amount or varied in the opposite direction of component A. In another example, two or more components are delivered using any of the delivery techniques described herein

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(col. 18, lines 28-38, the claimed “includes means for controlling the sources in essentially the same operation such that plasma materials from the sources are **co-deposited** with respect to an area on the surface of the substrate” of claim 16).

‘671 also teaches the components can be delivered to predefined regions on the substrate ...**sequentially** (col. 30, lines 44-46, the claimed “means for controlling the sources in essentially the same operation such that plasma materials from the sources are **deposited as layers** with respect to an area on the surface of the substrate” of claim 17).

**4. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over ‘671 and ‘967, further in view of Fujii (US 4833101, hereafter ‘101).**

‘671 and ‘967, together, teach all limitations of claim 3, as discussed above. ‘671 teaches film thickness and uniformity can be controlled by ... **substrate-nozzle distance**, ... and/or positioning the spray gun, spray nozzle or substrate, etc. (col. 28, lines 25-28), therefore, strongly suggested a mechanism to change the distance between substrate and nozzle.

‘101 is an analogous art in the field of growing semiconductor to substrate by molecular beam epitaxy (title) using a minimum number of effusion cells (abstract, line 10, similar evaporation function as the plasma source of ‘671). ‘101 teaches that a MBE chamber in such a geometric arrangement that each cell faces the substrate surface and is substantially equal distance from the substrate (col. 2, lines 40-42).

At the time of the invention was made, it would have been obvious to a person having ordinary skill in the art to have arranged the plurality of plasma sources in Fig. 14 of '671 at substantially equal distance from the substrate, as taught by '101, for its suitability in deposition. The selection of something based on its known suitability for its intended use has been held to support a *prima facie* case of obviousness. MPEP 2144.07. Along with '671's teaching that eight RF magnetron sputtering guns 110 ... inserted from the side of the reaction chamber in a complete circle (col. 25, lines 24-27), a person of ordinary skill in the art would have known to place the substrate at the central location and each plasma source at a same distance from the substrate/central location (the limitation of claim 7).

**5. Claims 10-11, 13, and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over '671 and '967, further in view of Chiang et al. (US 7544574, hereafter '574).**

'671 and '967, together, teach all limitations of claim 8, as discussed above. '671 and '967, together, do not teach the limitations of: "the relationship of the number (N) of separately defined areas in one column to the number of separately defined areas in an adjacent column is areas in column<sub>N</sub> = N and areas in adjacent column<sub>N+1</sub> = N+1" of claim 10 nor "the relationship of the number of separately defined areas in one row to the number of separately defined areas in an adjacent row is: areas in row<sub>N</sub> = N and areas in adjacent row<sub>N-1</sub> = N-1" of claim 11.

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'574 is an analogous art in the field of systems for discretized, combinatorial processing of regions of a substrate (abstract) in thin film processing (field of the invention) such as plasma sputtering (col. 16, lines 55-56). '574 teaches the parallel processing structure, which may be a plurality of separate cells, or a plurality of cells in a single structure, is configured such that every other region 903 is processed with the edge of the processing cells contacting only the corners of the regions to be processed (Figs. 9B-C, and 9E, col. 23, last line to col. 24, line 2, the claimed "column<sub>N</sub> = N and areas in adjacent column<sub>N+1</sub> = N+1" of claim 10 and "column<sub>N</sub> = N and areas in adjacent column<sub>N+1</sub> = N-1" of claim 11).

At the time of the invention was made, it would have been obvious to a person having ordinary skill in the art to have replaced the arrangement of array on a substrate as shown in Figs. 1-4 of '671 with the arrangement of the plurality of processing cell as shown in Figs. 9B-C and 9E of '574, for the purpose of suitable cell arrangement. The selection of something based on its known suitability for its intended use has been held to support a *prima facie* case of obviousness. MPEP 2144.07.

'574 further teaches the substrate may contain depressed regions on which combinatorial processes take place (col. 13, lines 48-50, see also Fig. 1C, lower right, the claimed "the substrate comprises a side surface of a block positioned within the central location of the chamber, the block having a multiplicity of cylindrical substrate elements extending from the side surface thereof, each cylindrical substrate element

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individually defining a selected area, the cylindrical substrate elements maintained in an array of cylindrical columns and cylindrical rows formed within the block, in which the upper surfaces of the cylindrical substrate elements comprise the discrete areas exposed to the sources” of claim 13.

Claims 18-20 are rejected for substantially the same reasons as claims 15-17 rejection, respectively, as discussed above.

**6. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over ‘671, ‘967, and ‘574, further in view of Wang et al. (US 20050035002, hereafter ‘002).**

‘671, ‘967, and ‘574, together, teach all limitations of claim 13, as discussed above. ‘574's Fig. 1C also show the limitations of “the cylindrical substrate elements are inset within the block in a matrix” of claim 14.

‘671, ‘967, and ‘574, together, do not teach the limitations of: “a plate having a matrix of openings concentric with the matrix of elements in the block is applied facing the surface of the block, such that the openings in the plate are aligned with the elements and the cross-section area of an opening in the plate is less than the cross-section area of the surface of the corresponding concentric cylindrical element” of claim 14.

‘002 is an analogous art in the field of electric screening system (title) in the detachable electrode arrangement provides an electrode array for combinatorial

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synthesis ([0067], second last sentence) applicable to physical vapor deposition PVD ([0062], second sentence). '002 teaches a holder 170 includes a holder block 171 and a back plate 180 which holds RDE 20 in place ([0068], see also [0066]), a holder block 171 (Fig. 15 and 16, [0070], the claimed plate) with the openings 172 sized to be slightly smaller than the outside diameter of electrodes 20 for light press fitting of the electrodes 20 to the holder block 171 ([0070], second last sentence, note 20 corresponds to the claimed inset).

At the time of the invention was made, it would have been obvious to a person having ordinary skill in the art to have adopted the holder arrangement including a holder block/plate with opening smaller than the electrodes/inset, as taught by '002, in the combined apparatus of '671, '967, and '574, for its suitable use as a holder for the combinatorial synthesis in the PVD system. The selection of something based on its known suitability for its intended use has been held to support a *prima facie* case of obviousness. MPEP 2144.07.

### ***Response to Arguments***

Applicant's arguments filed 08/21/2007 have been fully considered but they are not persuasive.

7. In regarding to Wu '671, Applicants appear to argue that '671 does not teach x-y movement of the substrates, see lines 1-7 of page 10.

This argument is found not persuasive.



In a different embodiment (Fig. 5), '671 teaches the substrate may also be **translated** relative to the frame 206 so that shutter masks 202, 203 may be positioned at selected regions on the substrate (col. 17, lines 44-46) instead of by moving the X--X and Y--Y shutter masks 202, 203 (col. 17, lines 40-41) and/or forming the two dimension pattern of Figs. 2-4. Therefore, needs a two dimensional motion mechanism.

8. In regarding to Corderman et al. '967, Applicants argue that '967 applies materials in a continuous gradient but not upon discrete areas, see lines 7-13 of page 10.

This argument is found not persuasive.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

The rejection is based '671 in view of '967. '671 teaches deposition upon discrete areas (Figs. 1-4) and '967 is cited for robot controlled x-y table.

9. In regarding to various depend claims, see the bridging paragraphs between pages 10 and 11, Applicants' cited features are all addressed in the rejection above.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

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§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KEATH T. CHEN whose telephone number is (571)270-1870. The examiner can normally be reached on 6:30AM-3 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Cleveland can be reached on 571-272-1418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/KEATH T CHEN/  
Examiner, Art Unit 1792

/Michael Cleveland/

Supervisory Patent Examiner, Art Unit 1792